Date: December 21, 2004

Project Title: Wear Tolerance of Cool Season Grasses on Sports Fields

Project Leader: Gwen K. Stahnke, Eric Miltner and Matt Johns

Progress: to be submitted for all projects funded in FY)05 (July 1, 2004 to June 30, 2005); and FY06 (July1, 2005 to June 30, 2006).

2004 Shade and Wear Effects on Alternative Grasses for Sports Field Mixes
Matt Johns, Gwen Stahnke, and Eric Miltner, WSU-Puyallup

Introduction:
Mixing Kentucky bluegrass *(Poa pratensis L.)* and perennial ryegrass *(Lolium perenne L.)* produces a turf that is wear tolerant, stable and playable for athletic field use. Recently, there has been increased interest in mixing annual ryegrass *(L. multiflorum)* and intermediate ryegrass *(L. hybridium)* with Kentucky bluegrass(Table 1, 2 &3). These species establish very quickly, and may be less persistent than perennial ryegrass, which could allow Kentucky bluegrass to dominate the stand. This could be desirable, since Kentucky bluegrass is better able to recover from injury compared to perennial ryegrass. The annual and intermediate ryegrass would also act as a nurse grass to help the Kentucky bluegrass establish better. The study began in September 2003 and will continue until December 2006. It is partially funded by NTA. Donations of material were accepted from Walrath Trucking. Donations of labor to help build the shade structure were accepted from Green Shield Systems.

Methods and Materials
The objective of this study is to evaluate Kentucky bluegrass, and perennial, annual and intermediate ryegrasses alone and in mixtures. Turf has been established in native Puyallup sandy-loam soil and on a simulated sand-based sports field (8-12" depth of sand). One area of the sports field will be under a shade structure modeled after the louver system at UC Riverside. Light levels will be measured with a quantum sensor and a quantum radiometer photometer in Photosynthetically Active Radiation (PAR): 400-700 nanometer ranges.

All treatments received simulated sports traffic with a Brinkman Traffic Simulator. This apparatus provided both compaction and shear stress. Spring wear will start in March and continue until the end of May, and Fall wear will be applied again in September and continue through November of each year The level of wear will simulate three games per week for the duration of a football/soccer season. Turf will be rated for quality and recovery from wear throughout the study. Shear strength, or the ability of the turf to hold together under the stress of athletes, will be measured with the Clegg Turf Shear Tester. Measurements will be conducted before, during and after applying treatments. Measurements were recorded for 2004, but will not be evaluated until spring of 2005 and when data is completed at the end of 2005 wear.

Results
The annual and intermediate ryegrasses established quickly. Both grasses germinated three days earlier than the perennial ryegrass and we received 100% cover after four weeks. Visual observations of the perennial, intermediate and annual ryegrass mixed with the Kentucky bluegrass, shows that all tended to help increase germination and establishment of the Kentucky bluegrass.

Table 1. Perennial, intermediate, annual ryegrass, and Kentucky bluegrass cultivars and blends and seeding rates.

Cultivars and blends	Seeding Rates
PR blend†: Admire, Aberelf and PR 4220	6lbs/1000ft^2 (1/3 ea.)
'Transeze' IR	3.5lb/1000ft^2
'Axcella' AR	3.5lbs/1000ft^2
KBG blend 1: Limousine, Langara, and Shamrock	2.5lbs/1000ft^2(1/3 ea.)
KBG blend 2: SR2284, Northstar, and Blackstone	2.5lbs/1000ft^2 (1/3 ea.)

† PR = perennial ryegrass, IR = intermediate ryegrass, AR = annual ryegrass, KBG= Kentucky bluegrass.

Table 2. Grass seed mixture treatments for experiments 1 & 2, based on blends in Table 1. Mixture percentage based on seed wt.

Treatment 1:	PR blend (80%) + KBG blend 1 (20%)
Treatment 2:	IR (50%) + KBG blend 1 (50%)
Treatment 3:	AR (50%) + KBG blend 1 (50%)
Treatment 4:	PR blends (80%) + KBG blend 2 (20%)
Treatment 5:	IR (50%) + KBG blend 2 (50%)
Treatment 6:	AR (50%) + KBG blend 2 (50%)

Table 3: Grass seed mixtures for experiments based on blends in Table 1 and mono-stands of KBG, PR, IR & AR cultivars. Mixture based on seed wt.

Treatment 1: Moonlight KBG

Treatment 2: Blackstone KBG

Treatment 3: SCR-320 N.W. KBG

Treatment 4: Northstar KBG

Treatment 5: SR 2284 KBG

Treatment 6: Orfeo KBG

Treatment 7: Broadway KBG

Treatment 8: Limousine KBG

Treatment 9: Langara KBG

Treatment 10: Shamrock KBG

Treatment 11: Admire PR

Treatment 12: Aberelf PR

Treatment 13: SR4220 PR

Treatment 14: Transeze IR

Treatment 15: Axcella AR

Treatment 16: PR blend (80%) + KBG blend 1 (20%)

Treatment 17: IR (50%) + KBG blend 1 (50%)

Treatment 18: AR (50%) + KBG blend 1 (50%)

Treatment 19: PR (80%) + KBG blend 2 (20%)

Treatment 20: IR (50%) + KBG blend 2 (50%)

Treatment 21: AR (50%) + KBG blend 2 (50%)

Treatment 22: P-105 KBG